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ART UNIT	PAPER NUMBER
2452	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)	
Office Action Summary	10/767,182	PILLAI ET AL.	
	Examiner	Art Unit	
	HIEU HOANG	2452	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _22 March 2011_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _28-43_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _28-43_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to the communication filed on 03/22/2011.

2.   Claims 1-27 are cancelled.

3.   Claims 28-43 are new and pending.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
>
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
>
> conditions and requirements of this title.

5.   Claims 36-43 are rejected under 35 USC 101 because the claimed invention is

directed to nonstatutory subject matter. The "communication interface" claim is not a

process, a machine, manufacture, or composition of matter. The claimed elements

"processor", "port", "interconnection mechanism" are non-structural limitations, and

given broadest reasonable interpretation, can be read as software modules per se. (see

IEEE100 - The Authoritative Dictionary of IEEE Standards Terms, 7th ed. for definitions

of the terms). Therefore, the claimed subject matter as a whole fails to fall within the

definition of a process, a machine, manufacture, or composition of matter. Applicant is

suggested to add any physical hardware element to the claims (for example, a memory)

to overcome the rejection.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   **Claims 28-34, 36-42 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over Saha et al. (US 2004/0117375, hereafter Saha), in view of Zuberi

(US 2003/0204552).

8.   For claim 28, Saha discloses a method for performing remote access commands

between nodes, the method comprising:

establishing a mutually pre-agreed upon data allotment for a first node and a

second node ([0054], fig. 5, *memory allocation 516 and 526, each of a client and a*

server allocates a portion of its memory for the other);

detecting an application request in a request queue ([0063], *the transferor has a*

transfer queue for queuing data transfer to the recipient), the application request

identifying a data access task to be performed between the first and second node

([0030], *Write task including Insert*, [0037], *Read task including Update or Select*);

assigning a context including a set of channel adapter resources (fig. 5,

assigning client/server four memory buffers) of the first node to process the application

request to completion of the data access task, the context operating a task manager

that tracks an offset for the data access task ([0059], lines 9-19, [0060], lines 14-22, *mechanism for queuing data in asynchronous transfer and tracking which data to be transferred next upon a completion of data transfer in a buffer*);

issuing a first request from the first node to the second node, the first request requesting the data access task be performed between the first node and the second node ([0060], fig. 5, [0056], [0059], *first data and ACK pair indicates client request to write data to server's database, e.g., from buffer 515 to buffer 525*);

receiving, at the first node, a first response from the second node that partially completes the data access task and that contains data in an amount not exceeding the data allotment (fig. 5, [0059], lines 7-9, *first ACK indicates data in buffer 525 has been used by the server; buffer space not exceeding the memory allotment*);

issuing at least one subsidiary request from the first node to the second node to further complete the data access task between the first node and the second node, the at least one subsidiary request based on an amount of partial completion of the data access task between the first node and the second node ([0059], lines 9-19, [0060], lines 14-22, *further data transfer is possible upon completion of a previous data transfer in a buffer*); and

receiving, from the second node in response to the at least one subsidiary request, at least one corresponding subsidiary response that further completes the data access task between the first node and the second node and that contains data in an amount not exceeding the data allotment ([0059], lines 9-19, [0060], lines 14-22, *further*

data transfer request is possible upon completion of a previous data transfer in a buffer, buffer space not exceeding the memory allotment);

wherein a new starting value for each subsidiary request is calculated from the offset ([0058], *offsetting or determining the next data chunk to be transferred*); wherein the context is pre-emptible between the first response and a first subsidiary request, and between a subsidiary response and a subsequent subsidiary request ([0059], lines 9-19, [0060], lines 14-22, *buffer is emptied between upon completion of a buffer transfer so that subsequent transfers can be done*).

Saha does not disclose the context pre-emptible between the first response and a first subsidiary request, and between a subsidiary response and a subsequent subsidiary request to support other access tasks by the channel adapter performing a context switch.

Zuberi discloses in an event of a context switch, context resources for a task is pre-empted for processing other tasks ([0004], [0007], [0030], [0033], fig. 4, resources can be preempted to support two RDMA tasks)

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Saha and Zuberi's context switch. The motivation would be to make resources available to support different tasks with different priorities.

9.   For claim 29, Saha-Zuberi further discloses pre-empting the context prior to full completion of the data access task; issuing a second request from the first node for an

other data access task; and resuming the context (Zuberi, [0004], [0007], [0030], [0033], fig. 4).

10.   For claim 30, Saha-Zuberi further discloses the other data access task is identified by a different application request in a different request queue (Zuberi, [0004], [0007], [0030], [0033], fig. 4).

11.   For claim 31, Saha further discloses issuing at least one subsidiary request comprises: calculating a remaining amount of data required to complete the data access task between the first node and the second node; and creating a least one subsidiary request to reference at least a portion of the remaining amount of data required to complete the data access task (Saha, [0057], [0058], Zuberi, [0004], [0007], [0030], [0033], fig. 4).

12.   For claim 32, Saha further discloses calculating the remaining amount of data comprises: determining a total completed amount of data processed for the data access task by the first request and associated first response and all subsidiary requests and corresponding subsidiary responses between the first and second node; and determining the remaining amount of data required to complete the data access task as a difference between an initial amount of data specified by an application request and the total completed amount of data (Saha, [0057], [0058], Zuberi, [0004], [0007], [0030], [0033], fig. 4).

13.   For claim 33, Saha further discloses the first and second nodes are nodes that

utilize channel adapters to exchange the first request and the at least one subsidiary

request and the corresponding first response and the at least one subsidiary response;

the application request is a remote direct memory access request for the first node to

access data in a memory at the second node; and an initial amount of data specified by

the application request is a total amount of data that the first node is to access in the

memory at the second node (Saha, [0057], [0058], Zuberi, [0004], [0007], [0030],

[0033], fig. 4).

14.   For claim 34, Saha further discloses the first request and the at least one

subsidiary request are read remote direct memory access commands issued by the first

node to read data in the memory from the second node (Saha, [0037]).

15.   Claims 36-42 are rejected for the same rationale as in claims 28-34 respectively.

16.   Claims 35 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Saha-Zuberi, further in view of Turner et al. (An Approach For Congestion

Control in Infiniband, hereafter Turner).

17.   For claim 35, Saha-Zuberi discloses the invention as in claim 11. Saha-Zuberi

does not disclose dynamically determining the data allotment between the first and

second nodes based on at least one external data allotment event, such that if the at

least one external data allotment event occurs, the first and second nodes change a

value of the data allotment.

However, Turner discloses dynamically determining the data allotment between

the first and second nodes based on at least one external data allotment event, such

that if the at least one external data allotment event occurs, the first and second nodes

change a value of the data allotment (fig. 2, section 5.1.3.2, changing a receive window

based on a condition)

Therefore, it would have been obvious for one skilled in the art at the time of the

invention to combine the teachings of Saha-Zuberi and Turner to adjust the amount of

maximum data allotment (window control) to, e.g., avoid network congestion (Turner,

abstract).

18.   Claim 43 is rejected for the same rationale given in claim 35.

Conclusion

19.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Hieu T. Hoang whose telephone number is 571-270-

1253. The examiner can normally be reached on Monday-Thursday, 8 a.m.-5 p.m.,

EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Thu Nguyen can be reached on 571-272-6967. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO

Customer Service Representative or access to the automated information system, call

800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HIEU HOANG/
Primary Examiner, Art Unit 2452